## Science LOS ALAMOS NATIONAL LABORATORY.





One day when little Claire
Ulam was watching some
children playing ball with
their father, a friend asked
whether her father ever played
like that with her. The
answer was an emphatic
"No! No! All my father
does is think, think, think!
Nothing but think!"



LOS ALAMOS SCIENCE

NUMBER 15

SPECIAL ISSUE

Part I	Stan Ula	am—The Man, His Life, His Style	
		Esquisse by Françoise Ulam	. 6
		Vita—Excerpts from Adventures of a Mathematician by S. M. Ulam	. 8
		The Lost Café by Gian-Carlo Rota	. 23
		From Above the Fray by Carson Mark	. 33
Part II	The Ula	nm Legacy—Interdisciplinary Approaches	
	MATHE	MATICS	. 30
		The Spirit of Play—A Memoir for Stan Ulam by David Hawkins	. 39
			. 52
		The Existence and Significance of Ergodic Transformations—Excerpts from the Introduction to Oxtoby and Ulam's "Measure-Preserving Homeomorphisms and Metrical Transitivity"	
		A Similarity Measure for Graphs—Reflections on a Theme of Ulam by Ronald L. Graham	11
	PHYSICS		12
		The Beginning of the Monte Carlo Method by N. Metropolis	12
		Stan Ulam, John von Neumann, and the Monte Carlo Method by Roger Eckhardt Random-Number Generators by Tony Warnock Monte Carlo at Work by Gary D. Doolen and John Hendricks	13
		Early Work in Numerical Hydrodynamics by Francis H. Harlow	14

## STANISLAW ULAM 1909-1984

Instabilities and Turbulence by Didier Besnard, Francis H. Harlow, Norman L. Johnson, Rick Rauenzahn, and Jonathan Wolfe	145
Reynolds Number Reynolds Number Revisited	
Discrete Fluids by Brosl Hasslacher	175
Part I: Background The Continuum Argument The Hilbert Contraction	
Part II: The Simple Hexagonal Model: Theory and Simulations Calculations Using Lattice Gas Techniques by Tsutomu Shimomura, Gary Doolen, Brosl Hasslacher, and Castor Fu	
Part III: The Promise of Lattice Gas Methods Reynolds Number and Lattice Gas Calculations	
Nonlinear Science—From Paradigms to Practicalities by David K. Campbell  The Simple but Nonlinear Pendulum Solitons in the Sine-Gordon Equation Hamiltonian Chaos and Statistical Mechanics	218
The Ergodic Hypothesis: A Complicated Problem of Mathematics and Physics by Adrian Patrascioiu The FPU Problem: Excerpts from "Studies of Nonlinear Problems" by Fermi, Pasta, and Ulam Does Equipartition of Energy Occur in Nonlinear Continuous Systems?	263
BIOLOGY	280
Reflections on the Brain's Attempts To Understand Itself by S. M. Ulam An Ulam Distance by William A. Beyer	283
Sequence Analysis—Contributions by Ulam to Molecular Genetics by Walter B. Goad	288
Part III The Ulam Touch—Unpublished Items	
A Memorable Memo by J. Carson Mark and S. M. Ulam	294
Sub Rosa—A Trialogue by S. M. Ulam	295
Conversations with Rota transcribed and edited by Françoise Ulam	300
The Publications of Stanislaw M. Ulam	313

The staff of Los Alamos Science is deeply indebted to Françoise Ulam for her help on this issue. She generously opened Stan's files to us and gave advice and moral support whenever she was called upon. Her unfailing kindness and patience added a special element to the privilege and challenge of working on this volume.